



# **2017 Rate Determination Field Survey Methodology**

**Public Workshop – October 30, 2015**



# Introduction

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# Agenda

- Workshop Purpose
- 2017 Rate Study Methodology
- Financial Risk Assessment
- Confidence Levels / Error Rates
- Survey Sites / Sample Size / Survey Methodology
- Bale Rate Study – Initial Findings
- Discuss Future Workshops – Related to Bale Rate Study
- Studies / Research Which May Impact Future Methods
- Questions / Comments / Input / Ideas





# Workshop Purpose

## California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

**“. . . the department shall . . . consult with private and public operators of curbside recycling programs, collection programs, and recycling centers concerning . . . ”**



# Workshop Purpose

## Concerning . . .

- The size of the statewide sample
  - # of containers surveyed
- Appropriate sampling methodologies
  - How samples are acquired and surveys conducted
- Alternatives to exclusive reliance on a statewide commingled rate
  - Is there a better way to pay out monies from the Fund?



# Our Goal

**To ensure payment of the most accurate segregated and commingled rates feasible in order to properly compensate consumers and industry, and to protect the solvency and integrity of the California Redemption Value (CRV) Fund.**



# 2017 Rate Study Methodology



# Financial Risk Assessment

- **Determine financial risk for each program and material:**
  - **Determine the monetary value of each material and for each program**
  - **Rank the monetary value from high to low**





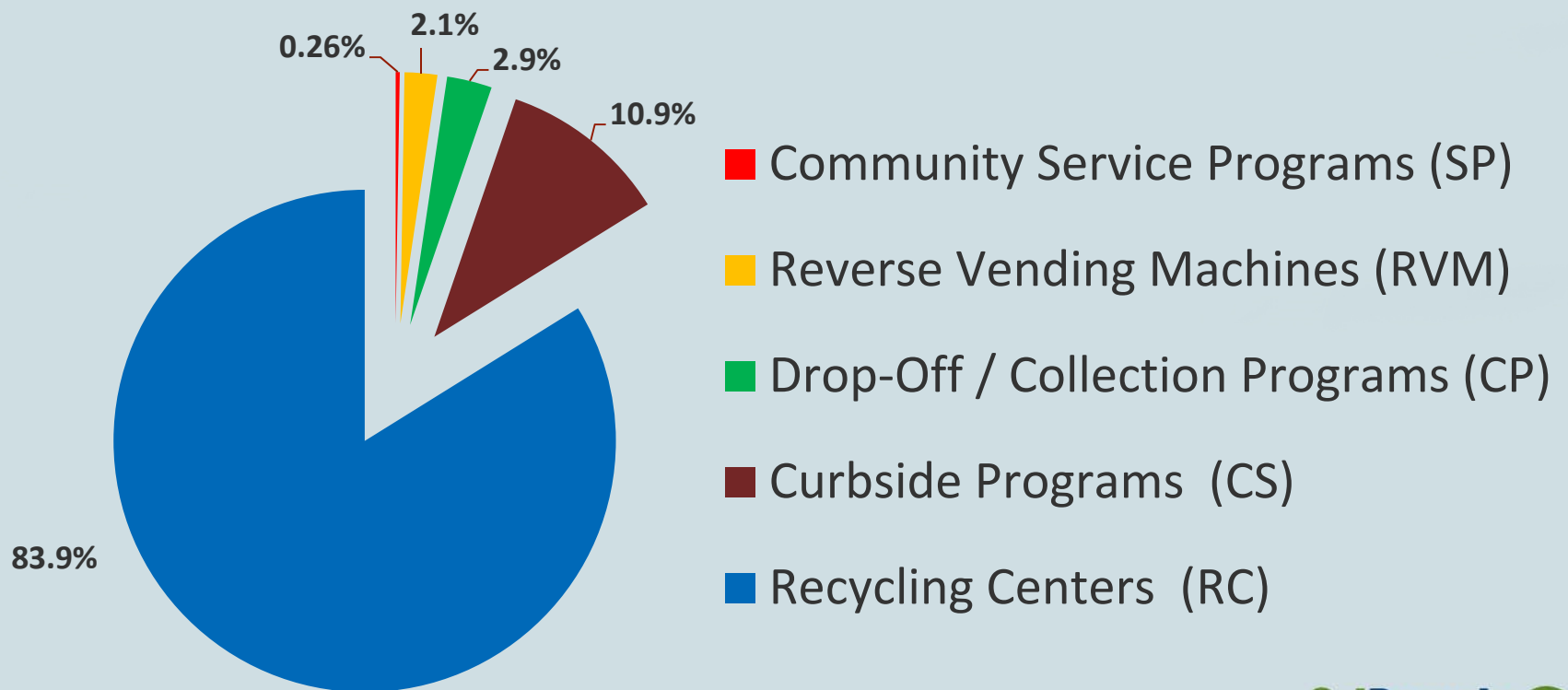
## **2017 CMRS Risk Assessment – All Programs**

- **Annual Value of All Materials Redeemed**

**\$1.086 billion**



## Monetary Value – All Recycling Programs





# Financial Risk Assessment

- **Based on the financial risk:**
  - **Determine confidence levels and error rates for each program and material type**
  - **Determine the number of containers to sample for each material for each program type**
  - **Determine the number of sites to survey for each program type**



# Sample Size Calculation

- Sample size is adjusted based on:
  - Standard Deviation of container weights
  - Standard Deviation of site survey material
- Based on data from previous year studies





# Definition: Confidence Level

- A percentage represents how certain the survey results will capture the true parameter.
- A confidence level of 95%, means a 95% certainty the survey results will capture the true parameter.
- A confidence level of 99%, means a 99% certainty the survey results will capture the true parameter.



# Definition: Error Rate

The “margin of error” is the expectation of survey sample results to vary by a certain amount.

Though it is impossible to sample all containers in a population, results from the sample would be close to, and representative, of the entire population, with a high level of confidence.



# Number of CRV Containers Sold Annually In California

- PET 9.46 billion
- Aluminum 8.35 billion
- Glass 3.04 billion
- HDPE 0.29 billion
- Other 0.22 billion (bi-metal & #3 - #7 plastics)
- **Total 21.36 billion**



# **Why Do We Care About Confidence Levels & Error Rates?**

- **Impacts recycling rates, and the \$1 billion+ CRV Fund**
- **It monetarily impacts every consumer and industry stakeholder who deals with CRV material**
- **We all need confidence and assurance that the rates are reliable and accurate**





# Rate Calculation Goals

Minimum Goal:

**95% Confidence Level**

**5% Error Rate**

**Most materials are currently surveyed at a  
95% Confidence Level with a 2% - 5% Error Rate**



# Rate Calculation Goals

For Highest Value Materials:

**99% Confidence Level**

**Less than 2% Error Rates**

**(RC - Aluminum, Glass, and PET material)**

**(83% of all redeemed CRV)**



# 2017 Rate Study Survey Sites



# Number of Sites Surveyed for 2017 Rate Year

- Recycling Centers 71 sites
- Curbside Programs 39 sites
- Drop-Off / Collection Programs 27 sites
- Reverse Vending Machines 22 sites
- Community Service Programs 16 sites
- Total 175 sites





# Survey Site Selection

## Population Determination:

- Currently operational programs
- Certified at least eight months during prior Fiscal Year
- Reported volume to DORiiS during prior Fiscal Year
- Not receiving an Individual Commingled Rate (ICR)



# Site Selection

Sites are grouped by region:

- **Southern California**
  - Los Angeles, San Diego, Orange, Riverside, San Bernardino, Ventura, Santa Barbara, and Imperial Counties (8 counties)
- **Northern California**
  - All other counties (50 counties)



# Survey Site Selection

- Sites are randomly selected by a computer program
- Sites are placed in volume strata for each region
- Proportional number of sites are selected from each volume strata



# What is Volume Strata?

Sites are stratified based on received PET volumes

- **Strata #1**    Top 50% of volume    (high volume)
- **Strata #2**    Next 25% of volume    (medium volume)
- **Strata #3**    Lowest 25% of volume    (low volume)





# 2017 Rate Study Periods

- 12 month study / Two six-month survey rounds
  - Round #1 \_ October 1, 2015 to March 31, 2016
  - Round #2 \_ April 1, 2016 to September 30, 2016
- Same sites surveyed in each six-month round (350 sites)
- The same number of containers are surveyed for each material type at each type of recycling program



# Rate Study Periods

- Surveys are scheduled every month of the year
- Surveys are scheduled most weeks of the year
- Surveys are conducted every day of the week (RCs)
- Surveys are distributed evenly over all seasons
  - To reflect “seasonality” (all seasons of the year)



# Materials Sampled

- Recycling Centers (RCs)
  - Aluminum
  - Glass
  - HDPE plastic
  - PET plastic
  - Bi-Metal
  - #3 - #7 plastic resins



# Materials Sampled

- Curbside (CS), Drop-Off / Collection (CP), RVMs, Community Service Programs (SP)
  - Aluminum
  - Glass
  - HDPE plastic
  - PET plastic





# 2017 Annual Sample Recycling Centers

- Aluminum = 13,000+ containers
- Glass = 13,000+ containers
- HDPE = 10,000+ containers
- PET = 40,000+ containers
- Bi-Metal = 2,000+ containers
- #3 - #7 plastics = 2,000+ containers

**80,000+**



# 2017 Annual Sample Curbside Programs

- Aluminum = 3,000+ containers
  - Glass = 5,000+ containers
  - HDPE = 7,000+ containers
  - PET = 7,000+ containers
- 22,000+**



# 2017 Annual Sample Collection Programs

- Aluminum = 2,500+ containers
  - Glass = 3,500+ containers
  - HDPE = 4,500+ containers
  - PET = 4,500+ containers
- 15,000+**



# 2017 Annual Sample Reverse Vending Machines

- Aluminum = 3,500+ containers
  - Glass = 3,500+ containers
  - HDPE = 500+ containers
  - PET = 16,000+ containers
- 23,500+**





# 2017 Annual Sample Community Service Programs

- Aluminum = 1,300+ containers
  - Glass = 2,200+ containers
  - HDPE = 3,000+ containers
  - PET = 3,000+ containers
- 9,500+



# Containers Surveyed for 2017 Rates

**150,000+**

(Aluminum, Glass, HDPE, PET, Bi-Metal, and #3 - #7 plastics)



# Survey Sample Selection

- Recycling Centers / RVMs
  - After customer transaction completed
  - Confirm “basis” of purchase from customer
  - Random / unbiased selection
  - Survey whole containers only



# Survey Sample Analysis

- Containers purchased as a single material type are counted and weighed into batches
  - RC / RVM – as purchased
    - Includes non-CRV and “contaminants”
  - CS / CP / SP – in “market ready” condition
    - To best represent bales reported to CalRecycle





# Survey Sample Analysis

- Container batches are further sorted, counted, weighed, and analyzed
  - CRV less than 24 oz. (5 cents)
  - CRV  $\geq$  24 oz. (10 cents)
  - Non-CRV material
  - Product Codes
  - Contaminants



# Calculations / Data

- Data from all surveys are combined by program type
  - Containers Per Pound (CPP)
  - Refund Value Per Segregated Pound (RVSP)
  - Refund Value Per Commingled Pound (RVCP)
  - Provide Data / Analysis / Information
    - Legislation / Regulation
    - CalRecycle Stakeholders
    - Industry Stakeholders



# Calendar for 2017 CMRS Survey

- Organize / Plan Apr. - Sep. 2015 **(Done)**
- Public Workshops May 1 & Oct. 30, 2015
- First Round Surveys Oct. 2015 – Mar. 2016
- Second Round Surveys Apr. 2016 – Sep. 2016
- Public Hearing for 2017 Rates Late October 2016
- Notice of 2017 Rates December 1, 2016
- 2017 Rates Effective January 1, 2017



# Workshop Purpose\_ Recap

## California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

- Size of the statewide sample
  - Is 150,000 containers a year enough?





# **Workshop Purpose\_ Recap**

## **California Beverage Container Recycling & Litter Reduction Act Section: 14549.5**

- **Appropriate sampling methodologies**
  - **Are current survey and sampling methods adequate?**



# Workshop Purpose\_ Recap

## California Beverage Container Recycling & Litter Reduction Act Section: 14549.5

- Alternatives to exclusive reliance on a statewide commingled rate
  - Are there better ways to determine how to pay monies from the Fund to consumers and industry stakeholders?



# **Survey Methodology**

**Questions, Comments, Input, etc.**



# Bale Rate Study – Initial Findings





# **Bale Rate Study\_ Purpose**

**In response to industry stakeholder input and concerns, the Rate Determination Section undertook a special study to research material from curbsides (CS), drop-off / collection (CP), and community service programs (SP).**



# Bale Rate Study\_ Objectives

- A comparison of current recycling program aluminum, PET, and HDPE commingled rates for CS, CP, and SP programs, with the rates derived from the Bale Rate Study.
- Recommendations to improve field survey and research procedures and methods.



# Bale Rate Study\_ Objectives

- Recommendations to produce more accurate recycling program rates that will appropriately compensate industry stakeholders and help protect the financial integrity and solvency of the Fund.
- Recommendations to provide better accounting of contamination and other materials found in CS, CP, and SP program bales.



# Bale Rate Study\_ Methodology

- How were survey sites chosen?
- How many sites and containers were surveyed?
- How were surveys conducted?
- Where did we get material?
- How did we conduct the survey?
- Do we have pictures?





# Bale Rate Study\_ Pictures





# Bale Rate Study\_ Pictures







# Bale Rate Study\_ Pictures



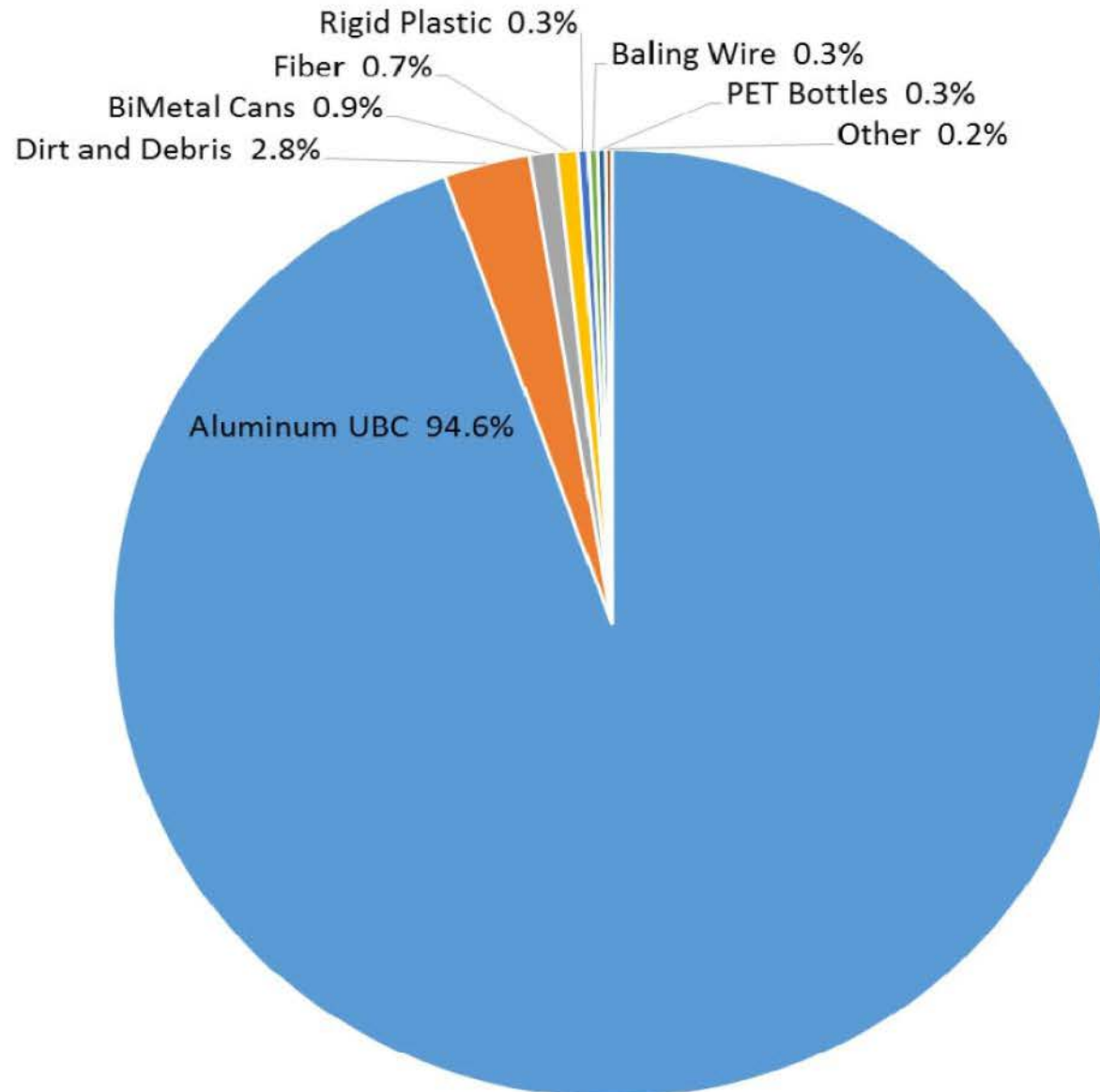


# Bale Rate Study\_ Pictures



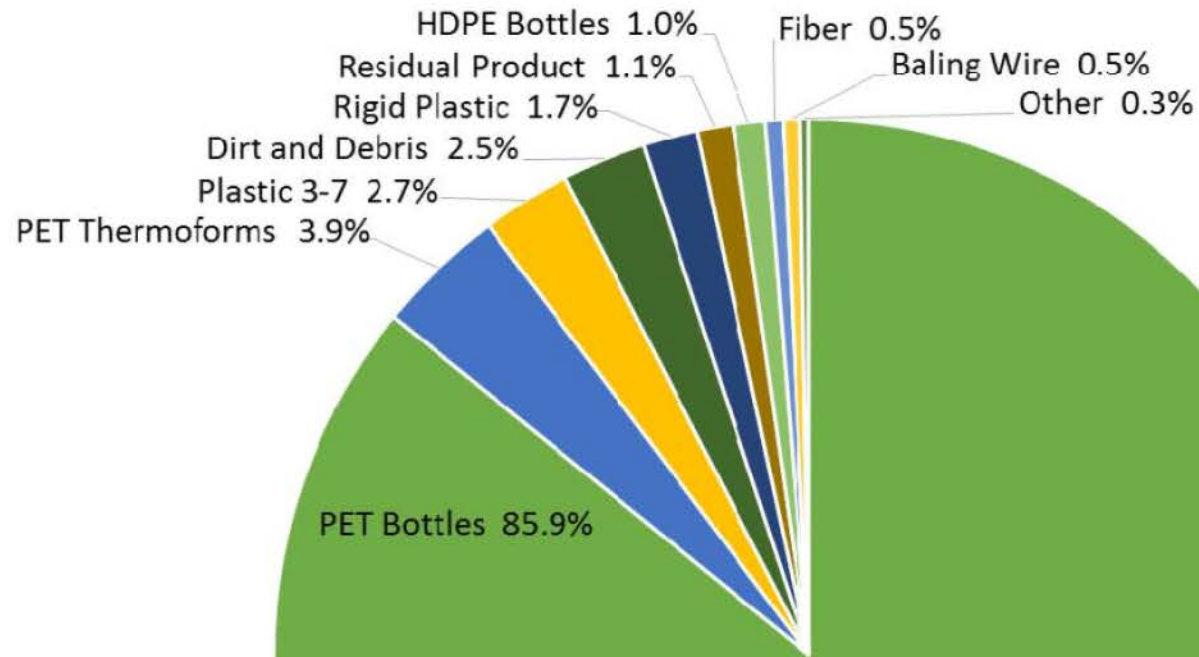


## Aluminum UBC Bale Composition (% by weight)



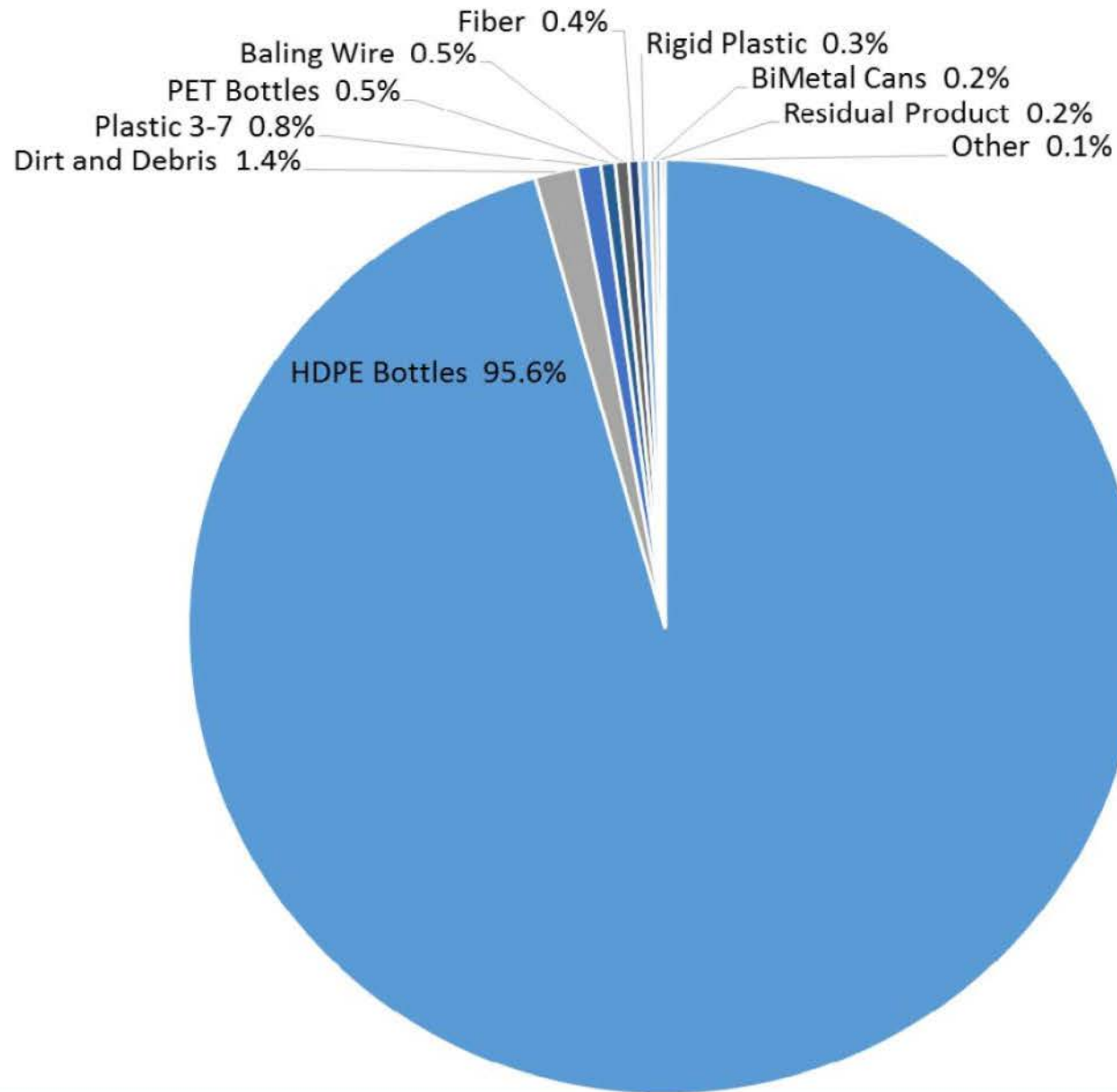
n = 11  
Avg 94.6%  
Min 85.6%  
Max 98.8%

## PET Bale Composition (% by weight)

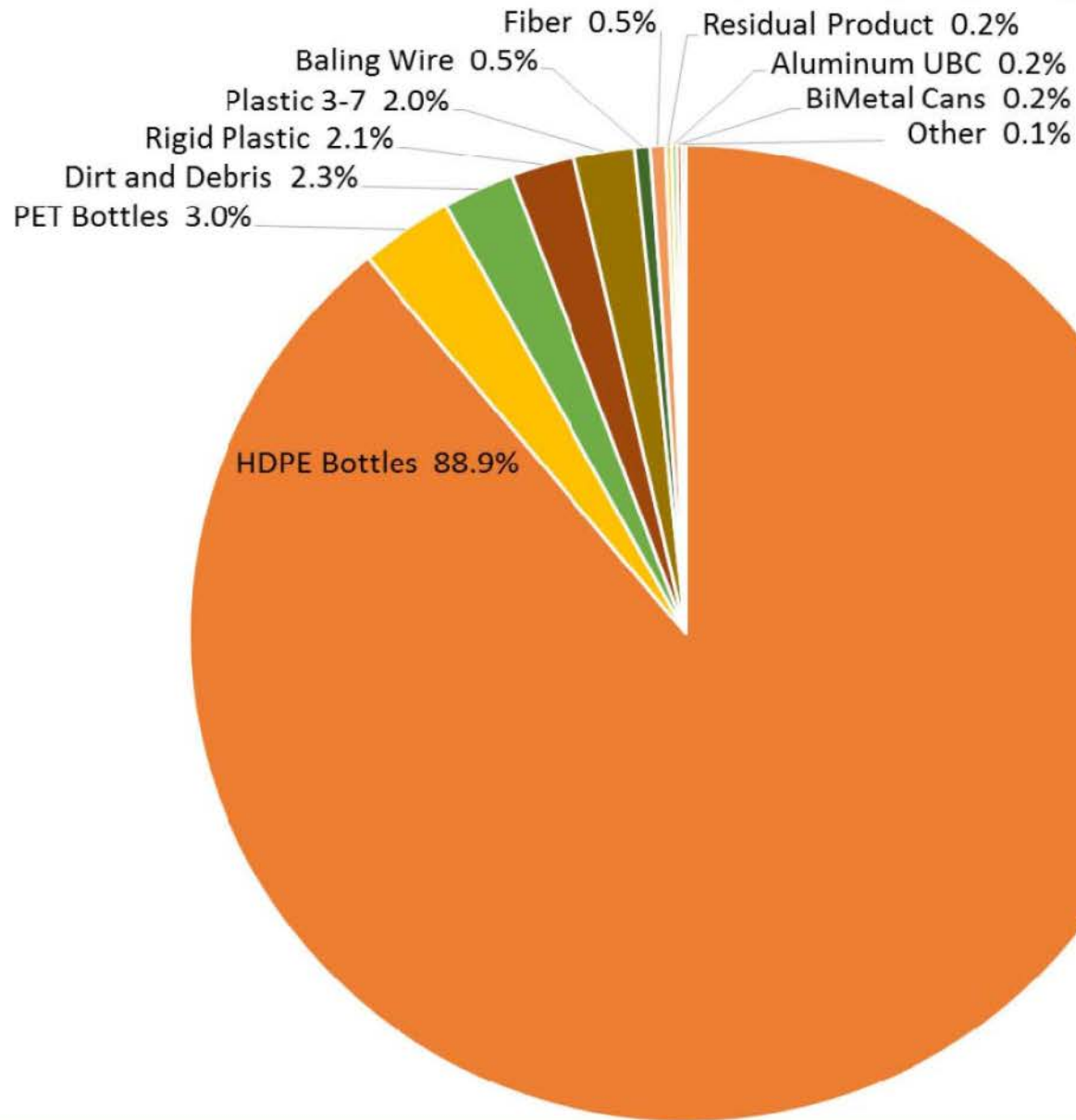


n = 11  
Avg 85.9%  
Min 53.1%  
Max 95.0%

## HDPE Natural Bale Composition (% by weight)



## HDPE Colored Bale Composition (% by weight)







# Bale Rate Study – Next Steps

- Public & Industry Workshops
  - January 2016 - May 2016
- Goal of improving surveys methods for the 2018 Rate Year



# **Current Studies / Research Which May Impact Future Survey Methods**

- **RC Rate Study - Impact of CalRecycle Staff Presence on Recycling Center Survey Metrics**
- **Rate Study - Day of the Week, Time of the Day, etc.**
- **Rate Format Study - Decimal Points**



**We want to hear from you!**



**Questions? / Comments? / Input? /  
Ideas? / Ideas? / Ideas?**

**Is there other information or data you would  
like us to share, find, research, etc. for future  
presentations or publications?**





**Thank You!**



If you would like further information about our survey methods or rate calculations, please contact:

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